

#4



SEQUENCE LISTING

<110> Kinnerseely, Alan M.
Turano, Frank J.

<120> Methods for Regulating Plant GABA Production

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<150> US 60/246,367

<151> 2000-11-07

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<170> PatentIn version 3.1

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gcc	aat	att	cag	gta	aac	caaaa	aca	aaa	attgatt	aaattt	taaa	ccg	gtt	tagg		834
Ala	Asn	Ile	Gln	Val												
				165												
tctatg	ttta	cattgact	ca	atttcc	ggtt	caatac	aggt	t	tgc	ttg	gag	aaa	ttt			890
									Cys	Leu	Glu	Lys	Phe			170
gca	agg	tat	ttt	gaa	gtg	gag	ctt	aag	gaa	gtg	aag	ctg	aga	gaa	gga	938
Ala	Arg	Tyr	Phe	Glu	Val	Glu	Leu	Lys	Glu	Val	Lys	Leu	Arg	Glu	Gly	
				175					180					185		
tat	tac	gtg	atg	gac	cct	gac	aaa	gcg	ggt	gaa	atg	gta	gac	gaa	aac	986
Tyr	Tyr	Val	Met	Asp	Pro	Asp	Lys	Ala	Val	Glu	Met	Val	Asp	Glu	Asn	
			190					195					200			
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Thr	Ile	Cys	Val	Val	Ala	Ile	Leu	Gly	Ser	Thr	Leu	Thr	Gly	Glu	Phe	
		205					210					215				
gaa	gac	ggt	aag	ctc	ctc	aac	gac	ctt	tta	gtc	gag	aaa	aac	aag	aaa	1082
Glu	Asp	Val	Lys	Leu	Leu	Asn	Asp	Leu	Leu	Val	Glu	Lys	Asn	Lys	Lys	
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acc	ggg	taattga	atc	aaa	ccaact	aac	aaattaa	ttttat	tatac	ttttgc	ctag					1138
Thr	Gly															
	235															
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atataa	aact	tatta	accaa	aacaaa	acca	tatatg	ttta	cattata	tgc	ttcctt	gtat					1258
cgatg	ggtg	tttaa	atact	gattaa	aaaaa	tgtttt	gctt	aaaaat	ataa	caattt	ataa					1318

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Trp Asp Thr Pro Ile
240
cac gtg gac gca gcg agt ggt ggg ttt att gct ccc ttc ttg tat ccg 1481
His Val Asp Ala Ala Ser Gly Gly Phe Ile Ala Pro Phe Leu Tyr Pro
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Ser Gly His Lys Tyr Gly Leu Val Tyr Ala Gly Ile Gly Trp Val Val
275 280 285
tgg aga acc aaa acc gat ttg cct gat gaa ctt atc ttc cat atc aat 1625
Trp Arg Thr Lys Thr Asp Leu Pro Asp Glu Leu Ile Phe His Ile Asn
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Ser Ser Gln Val Ile Ala Gln Tyr Tyr Gln Leu Ile
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Arg Leu Gly Phe Glu
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Glu Lys Thr Gly Arg Phe Asn Ile Val Ser Lys Glu Asn Gly Val Pro
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Leu Val Ala Phe Ser Leu Lys Asp Ser Ser Arg His Asn Glu Phe Glu
375 380 385 390
gtg gcc gaa atg ctt cgt cgc ttc ggc tgg atc gtt ccg gcc tac acg 2208
Val Ala Glu Met Leu Arg Arg Phe Gly Trp Ile Val Pro Ala Tyr Thr
395 400 405
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Met Pro Ala Asp Ala Gln His Val Thr Val Leu Arg Val Val Ile Arg
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 425 435

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 440 445 450

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 455 460 465 470

caa aga gaa gtc acg gcc tac tgg aag aag ttt gtg gac act aag act 2448
 Gln Arg Glu Val Thr Ala Tyr Trp Lys Lys Phe Val Asp Thr Lys Thr
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35 40 45

Glu Leu Lys Phe Asp Gly Asn Pro Arg Leu Asn Leu Ala Ser Phe Val
50 55 60

Thr Thr Trp Met Glu Pro Glu Cys Asp Lys Leu Met Met Glu Ser Ile
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Gln Asn Arg Cys Val Asn Met Ile Ala Arg Leu Phe Asn Ala Pro Leu
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115 120 125

Ala Val Met Leu Ala Gly Leu Ala Phe Lys Arg Gln Trp Gln Asn Lys
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Arg Lys Ala Leu Gly Leu Pro Tyr Asp Arg Pro Asn Ile Val Thr Gly
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Ala Asn Ile Gln Val Cys Leu Glu Lys Phe Ala Arg Tyr Phe Glu Val
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Glu Leu Lys Glu Val Lys Leu Arg Glu Gly Tyr Tyr Val Met Asp Pro
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Asp Lys Ala Val Glu Met Val Asp Glu Asn Thr Ile Cys Val Val Ala
 195 200 205

Ile Leu Gly Ser Thr Leu Thr Gly Glu Phe Glu Asp Val Lys Leu Leu
 210 215 220

Asn Asp Leu Leu Val Glu Lys Asn Lys Lys Thr Gly Trp Asp Thr Pro
 225 230 235 240

Ile His Val Asp Ala Ala Ser Gly Gly Phe Ile Ala Pro Phe Leu Tyr
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Pro Asp Leu Glu Trp Asp Phe Arg Leu Pro Leu Val Lys Ser Ile Asn
 260 265 270

Val Ser Gly His Lys Tyr Gly Leu Val Tyr Ala Gly Ile Gly Trp Val
 275 280 285

Val Trp Arg Thr Lys Thr Asp Leu Pro Asp Glu Leu Ile Phe His Ile
 290 295 300

Asn Tyr Leu Gly Ala Asp Gln Pro Thr Phe Thr Leu Asn Phe Ser Lys
 305 310 315 320

Gly Ser Ser Gln Val Ile Ala Gln Tyr Tyr Gln Leu Ile Arg Leu Gly
 325 330 335

Phe Glu Gly Tyr Arg Asn Val Met Asp Asn Cys Arg Glu Asn Met Met
 340 345 350

Val Leu Arg Gln Gly Leu Glu Lys Thr Gly Arg Phe Asn Ile Val Ser
 355 360 365

Lys Glu Asn Gly Val Pro Leu Val Ala Phe Ser Leu Lys Asp Ser Ser
 370 375 380

Arg His Asn Glu Phe Glu Val Ala Glu Met Leu Arg Arg Phe Gly Trp
 385 390 395 400
 Ile Val Pro Ala Tyr Thr Met Pro Ala Asp Ala Gln His Val Thr Val
 405 410 415
 Leu Arg Val Val Ile Arg Glu Asp Phe Ser Arg Thr Leu Ala Glu Arg
 420 425 430
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 Ala Arg Val His Ala Lys Met Ala Ser Gly Lys Val Asn Gly Val Lys
 450 455 460
 Lys Thr Pro Glu Glu Thr Gln Arg Glu Val Thr Ala Tyr Trp Lys Lys
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Thr Phe Ala Ser Arg Tyr Val Arg Asn Ser Leu Pro Arg
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ttggatagtt ttttttttgg ccgtgggtaa tgtttagat ttattatgtg ttatatacta 217

taaggaagga catgtttcgt tattttaact taatgtatca tcatttcac attaga ttc 276
Phe
30

gaa atg cct gag aac tca atc cca aaa gaa gca gct tac caa atc atc 324
Glu Met Pro Glu Asn Ser Ile Pro Lys Glu Ala Ala Tyr Gln Ile Ile
35 40 45

aac gac gag cta atg ctc gat ggt aac cca agg ctg aac cta gct tcc 372
Asn Asp Glu Leu Met Leu Asp Gly Asn Pro Arg Leu Asn Leu Ala Ser
50 55 60

ttc gtg acc aca tgg atg gag cca gaa tgt gac aag ctc atg atg gag 420
 Phe Val Thr Thr Trp Met Glu Pro Glu Cys Asp Lys Leu Met Met Glu
 65 70 75

tcc atc aac aag aac tac gtc gac atg gac gag tac cct gtc acc act 468
 Ser Ile Asn Lys Asn Tyr Val Asp Met Asp Glu Tyr Pro Val Thr Thr
 80 85 90

gag ctt cag aac cga tgt gtt aac atg ata gca cgt ctc ttc aac gcg 516
 Glu Leu Gln Asn Arg Cys Val Asn Met Ile Ala Arg Leu Phe Asn Ala
 95 100 105 110

ccg ctt ggt gac ggt gaa gct gcc gtt ggt gtt ggc acc gtc gga tcg 564
 Pro Leu Gly Asp Gly Glu Ala Ala Val Gly Val Gly Thr Val Gly Ser
 115 120 125

tcg gag gcg att atg ttg gcc ggt ttg gct ttt aag aga caa tgg cag 612
 Ser Glu Ala Ile Met Leu Ala Gly Leu Ala Phe Lys Arg Gln Trp Gln
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 Asn Lys Arg Lys Ala Gln Gly Leu Pro Tyr Asp Lys Pro Asn Ile Val
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aatacagggtt tgc tgg gag aaa ttc gca agg tat ttc gaa gtg gag ctt 820
 Cys Trp Glu Lys Phe Ala Arg Tyr Phe Glu Val Glu Leu
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 Ala Val Glu Met Val Asp Glu Asn Thr Ile Cys Val Ala Ala Ile Leu
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 Gly Ser Thr Leu Thr Gly Glu Phe Glu Asp Val Lys Leu Leu Asn Asp
 215 220 225

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 Leu Leu Val Glu Lys Asn Lys Gln Thr Gly
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tgcaga tgg gac acg cca ata cac gtg gac gca gcg agt ggt ggg ttt 1122
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 270 275 280

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Thr Leu Asn Phe Ser Lys Gly
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325 330

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Leu Gly Phe Glu
335

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Gly Tyr Arg Asn Val Met Asp Asn Cys Arg Glu Asn Met Met Val
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355 360 365

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Glu Asn Gly Val Pro Leu Val Ala Phe Ser Leu Lys Asp Ser Ser Arg
370 375 380 385

cac aac gag ttc gag gtg gcc cat aca ctc cgt cgc ttc ggc tgg atc 1842
His Asn Glu Phe Glu Val Ala His Thr Leu Arg Arg Phe Gly Trp Ile
390 395 400

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Val Pro Ala Tyr Thr Met Pro Ala Asp Ala Gln His Val Thr Val Leu
405 410 415

cga gtt gtt atc cga gaa gat ttc tct cga acc tta gcc gag aga ttg 1938
Arg Val Val Ile Arg Glu Asp Phe Ser Arg Thr Leu Ala Glu Arg Leu
420 425 430

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Val Ala Asp Phe Glu Lys Val Leu His Glu Leu Asp Thr Leu Pro Ala
435 440 445

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450 455 460 465

acg cca gag gag acg cag aga gaa gtc acg gcc tac tgg aag aag ttg 2082
Thr Pro Glu Glu Thr Gln Arg Glu Val Thr Ala Tyr Trp Lys Lys Leu
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Glu Leu Met Leu Asp Gly Asn Pro Arg Leu Asn Leu Ala Ser Phe Val
50 55 60

Thr Thr Trp Met Glu Pro Glu Cys Asp Lys Leu Met Met Glu Ser Ile
65 70 75 80

Asn Lys Asn Tyr Val Asp Met Asp Glu Tyr Pro Val Thr Thr Glu Leu
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Gln Asn Arg Cys Val Asn Met Ile Ala Arg Leu Phe Asn Ala Pro Leu
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Gly Asp Gly Glu Ala Ala Val Gly Val Gly Thr Val Gly Ser Ser Glu
115 120 125

Ala Ile Met Leu Ala Gly Leu Ala Phe Lys Arg Gln Trp Gln Asn Lys
130 135 140

Arg Lys Ala Gln Gly Leu Pro Tyr Asp Lys Pro Asn Ile Val Thr Gly
145 150 155 160

Ala Asn Val Gln Val Cys Trp Glu Lys Phe Ala Arg Tyr Phe Glu Val
165 170 175

Glu Leu Lys Glu Val Asn Leu Arg Glu Asp Tyr Tyr Val Met Asp Pro
180 185 190

Val Lys Ala Val Glu Met Val Asp Glu Asn Thr Ile Cys Val Ala Ala
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 Ile Leu Gly Ser Thr Leu Thr Gly Glu Phe Glu Asp Val Lys Leu Leu
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 Asn Asp Leu Leu Val Glu Lys Asn Lys Gln Thr Gly Trp Asp Thr Pro
 225 230 235 240
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 245 250 255
 Pro Glu Leu Glu Trp Asp Phe Arg Leu Pro Leu Val Lys Ser Ile Asn
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 Val Ser Gly His Lys Tyr Gly Leu Val Tyr Ala Gly Ile Gly Trp Val
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 Val Trp Arg Thr Lys Thr Asp Leu Pro Asp Glu Leu Ile Phe His Ile
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 Gly Ser Ser Gln Val Ile Ala Gln Tyr Tyr Gln Leu Ile Arg Leu Gly
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 Phe Glu Gly Tyr Arg Asn Val Met Asp Asn Cys Arg Glu Asn Met Met
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 Val Leu Arg Gln Gly Leu Glu Lys Thr Gly Arg Phe Lys Ile Val Ser
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 Lys Glu Asn Gly Val Pro Leu Val Ala Phe Ser Leu Lys Asp Ser Ser
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 Arg His Asn Glu Phe Glu Val Ala His Thr Leu Arg Arg Phe Gly Trp
 385 390 395 400
 Ile Val Pro Ala Tyr Thr Met Pro Ala Asp Ala Gln His Val Thr Val
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Phe Ala Ser Arg Tyr Val Arg Ala Val Val Pro Arg Phe
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tatctgtttg catatattga aacaggttc aag atg cct gac cat tgc atg ccc 210
Lys Met Pro Asp His Cys Met Pro
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aaa gat gct gct tat caa gtg atc aat gat gag ttg atg ctt gat ggt 258
Lys Asp Ala Ala Tyr Gln Val Ile Asn Asp Glu Leu Met Leu Asp Gly
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Asn Pro Arg Leu Asn Leu Ala Ser Phe Val Thr Thr Trp Met Glu Pro
55 60 65
gag tgt gac aaa ctc atc atg gat tct gtc aat aag aac tat gtt gat 354
Glu Cys Asp Lys Leu Ile Met Asp Ser Val Asn Lys Asn Tyr Val Asp
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Ser Glu Ala Ile Met Leu Ala Gly Leu Ala Phe Lys Arg Lys Trp Gln
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 Cys Trp Glu Lys Phe Ala Arg Tyr Phe Glu Val
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 Glu Leu Lys Glu Val Lys Leu Ser Glu Asp Tyr Tyr Val Met Asp Pro
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 225 230 235
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 Ile His Val Asp Ala Ala Ser Gly Gly Phe Ile Ala Pro Phe Leu Tyr
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 Pro Asp Leu Glu Trp Asp Phe Arg Leu Pro Trp Val Lys Ser Ile Asn
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 Val Ser Gly His Lys Tyr Gly Leu Val Tyr Ala Gly Val Gly Trp Val
 275 280 285
 gtc tgg aga aca aaa gat gat ttg cca gag gaa ctt gtc ttc cac atc 1209
 Val Trp Arg Thr Lys Asp Asp Leu Pro Glu Glu Leu Val Phe His Ile
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 Gly
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 Ser Ser Gln Ile Ile Ala Gln
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 gga tac aag aac ata atg gaa aac tgc atg gat aac gca agg agg cta 1520

Gly Tyr Lys Asn Ile Met Glu Asn Cys Met Asp Asn Ala Arg Arg Leu
 340 345 350

aga gaa gga ata gag atg aca ggg aag ttc aac att gtg tcc aaa gat 1568
 Arg Glu Gly Ile Glu Met Thr Gly Lys Phe Asn Ile Val Ser Lys Asp
 355 360 365

att ggc gtg cca cta gtg gca ttc tct ctc aaa gac agt agc aag cac 1616
 Ile Gly Val Pro Leu Val Ala Phe Ser Leu Lys Asp Ser Ser Lys His
 370 375 380 385

acg gtg ttt gag atc gca gag tct ttg aga aaa ttc ggg tgg atc ata 1664
 Thr Val Phe Glu Ile Ala Glu Ser Leu Arg Lys Phe Gly Trp Ile Ile
 390 395 400

ccg gct tac act atg cct gca gat gca cag cac att gct gtg ctc aga 1712
 Pro Ala Tyr Thr Met Pro Ala Asp Ala Gln His Ile Ala Val Leu Arg
 405 410 415

gtt gtg ata aga gaa gac ttt agc cga ggc ctt gca gat aga ctc atc 1760
 Val Val Ile Arg Glu Asp Phe Ser Arg Gly Leu Ala Asp Arg Leu Ile
 420 425 430

aca cat atc att cag gtg ctg aaa gag att gaa ggg ctt cct agc agg 1808
 Thr His Ile Ile Gln Val Leu Lys Glu Ile Glu Gly Leu Pro Ser Arg
 435 440 445

att gca cat ctt gct gcg gct gca gcg gtt agt ggt gat gat gaa gaa 1856
 Ile Ala His Leu Ala Ala Ala Ala Val Ser Gly Asp Asp Glu Glu
 450 455 460 465

gtt aaa gtg aag act gcc aag atg tcc ttg gag gat atc act aag tat 1904
 Val Lys Val Lys Thr Ala Lys Met Ser Leu Glu Asp Ile Thr Lys Tyr
 470 475 480

tgg aaa cgc ctt gtg gaa cac aag aga aat att gtc tgc taa 1946
 Trp Lys Arg Leu Val Glu His Lys Arg Asn Ile Val Cys
 485 490

<210> 10

<211> 494

<212> PRT

<213> Arabidopsis thaliana

<400> 10

Met Val Leu Ala Thr Asn Ser Asp Ser Asp Glu His Leu His Ser Thr
 1 5 10 15

Phe Ala Ser Arg Tyr Val Arg Ala Val Val Pro Arg Phe Lys Met Pro
 20 25 30

Asp His Cys Met Pro Lys Asp Ala Ala Tyr Gln Val Ile Asn Asp Glu
 35 40 45

Leu Met Leu Asp Gly Asn Pro Arg Leu Asn Leu Ala Ser Phe Val Thr
 50 55 60

Thr Trp Met Glu Pro Glu Cys Asp Lys Leu Ile Met Asp Ser Val Asn
 65 70 75 80

Lys Asn Tyr Val Asp Met Asp Glu Tyr Pro Val Thr Thr Glu Leu Gln
 85 90 95

Asn Arg Cys Val Asn Met Ile Ala Asn Leu Phe His Ala Pro Val Gly
 100 105 110

Glu Asp Glu Ala Ala Ile Gly Cys Gly Thr Val Gly Ser Ser Glu Ala
 115 120 125

Ile Met Leu Ala Gly Leu Ala Phe Lys Arg Lys Trp Gln His Arg Arg
 130 135 140

Lys Ala Gln Gly Leu Pro Ile Asp Lys Pro Asn Ile Val Thr Gly Ala
 145 150 155 160

Asn Val Gln Val Cys Trp Glu Lys Phe Ala Arg Tyr Phe Glu Val Glu
 165 170 175

Leu Lys Glu Val Lys Leu Ser Glu Asp Tyr Tyr Val Met Asp Pro Ala
 180 185 190

Lys Ala Val Glu Met Val Asp Glu Asn Thr Ile Cys Val Ala Ala Ile
 195 200 205

Leu Gly Ser Thr Leu Thr Gly Glu Phe Glu Asp Val Lys Gln Leu Asn
 210 215 220

Asp Leu Leu Ala Glu Lys Asn Ala Glu Thr Gly Trp Glu Thr Pro Ile
 225 230 235 240

His Val Asp Ala Ala Ser Gly Gly Phe Ile Ala Pro Phe Leu Tyr Pro
 245 250 255

Asp Leu Glu Trp Asp Phe Arg Leu Pro Trp Val Lys Ser Ile Asn Val
 260 265 270

Ser Gly His Lys Tyr Gly Leu Val Tyr Ala Gly Val Gly Trp Val Val
 275 280 285

Trp Arg Thr Lys Asp Asp Leu Pro Glu Glu Leu Val Phe His Ile Asn
 290 295 300

Tyr Leu Gly Ala Asp Gln Pro Thr Phe Thr Leu Asn Phe Ser Lys Gly
 305 310 315 320
 Ser Ser Gln Ile Ile Ala Gln Tyr Tyr Gln Phe Ile Arg Leu Gly Phe
 325 330 335
 Glu Gly Tyr Lys Asn Ile Met Glu Asn Cys Met Asp Asn Ala Arg Arg
 340 345 350
 Leu Arg Glu Gly Ile Glu Met Thr Gly Lys Phe Asn Ile Val Ser Lys
 355 360 365
 Asp Ile Gly Val Pro Leu Val Ala Phe Ser Leu Lys Asp Ser Ser Lys
 370 375 380
 His Thr Val Phe Glu Ile Ala Glu Ser Leu Arg Lys Phe Gly Trp Ile
 385 390 395 400
 Ile Pro Ala Tyr Thr Met Pro Ala Asp Ala Gln His Ile Ala Val Leu
 405 410 415
 Arg Val Val Ile Arg Glu Asp Phe Ser Arg Gly Leu Ala Asp Arg Leu
 420 425 430
 Ile Thr His Ile Ile Gln Val Leu Lys Glu Ile Glu Gly Leu Pro Ser
 435 440 445
 Arg Ile Ala His Leu Ala Ala Ala Ala Val Ser Gly Asp Asp Glu
 450 455 460
 Glu Val Lys Val Lys Thr Ala Lys Met Ser Leu Glu Asp Ile Thr Lys
 465 470 475 480
 Tyr Trp Lys Arg Leu Val Glu His Lys Arg Asn Ile Val Cys
 485 490

<210> 11

<211> 1705

<212> DNA

<213> Nicotiana tabacum

<220>

<221> CDS

<222> (71)..(1558)

<223>

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ctacgccgcc atg gtt ctg tcc aag aca gcg tcg gaa agt gac gtc tcc 109
Met Val Leu Ser Lys Thr Ala Ser Glu Ser Asp Val Ser
1 5 10
atc cac tcc act ttc gct tcc cga tat gtt cgt act tct ctt ccg agg 157
Ile His Ser Thr Phe Ala Ser Arg Tyr Val Arg Thr Ser Leu Pro Arg
15 20 25
ttt aag atg cca gag aat tcg ata cca aag gaa gca gca tat caa atc 205
Phe Lys Met Pro Glu Asn Ser Ile Pro Lys Glu Ala Ala Tyr Gln Ile
30 35 40 45
ata aat gat gag ctt atg tta gat gga aat cca aga cta aat tta gca 253
Ile Asn Asp Glu Leu Met Leu Asp Gly Asn Pro Arg Leu Asn Leu Ala
50 55 60
tct ttt gtg aca aca tgg atg gaa cca gag tgt aac aaa ctg atg atg 301
Ser Phe Val Thr Thr Trp Met Glu Pro Glu Cys Asn Lys Leu Met Met
65 70 75
gat tcc att aac aag aat tac gtt gac atg gat gaa tac cct gta acc 349
Asp Ser Ile Asn Lys Asn Tyr Val Asp Met Asp Glu Tyr Pro Val Thr
80 85 90
act gaa ctt cag aat cga tgt gta aac atg ata gct cat ttg ttt aac 397
Thr Glu Leu Gln Asn Arg Cys Val Asn Met Ile Ala His Leu Phe Asn
95 100 105
gca cca ctt gga gat gga gag act gca gtt gga gtt gga act gtt gga 445
Ala Pro Leu Gly Asp Gly Glu Thr Ala Val Val Gly Thr Val Gly
110 115 120 125
tcc tct gag gct att atg ctt gct gga tta gct ttc aag aga aaa tgg 493
Ser Ser Glu Ala Ile Met Leu Ala Gly Leu Ala Phe Lys Arg Lys Trp
130 135 140
caa aat aaa atg aaa gcc caa ggc aag ccc tgt gac aag ccc aat att 541
Gln Asn Lys Met Lys Ala Gln Gly Lys Pro Cys Asp Lys Pro Asn Ile
145 150 155
gtc act ggt gcc aat gtc cag gtg tgt tgg gag aaa ttt gca agg tat 589
Val Thr Gly Ala Asn Val Gln Val Cys Trp Glu Lys Phe Ala Arg Tyr
160 165 170
ttt gaa gtg gag cta aag gaa gta aag ttg agt gat gga tac tat gtg 637
Phe Glu Val Glu Leu Lys Glu Val Lys Leu Ser Asp Gly Tyr Tyr Val
175 180 185
atg gac cct gag aaa gct gtg gaa atg gtg gat gag aac aca att tgt 685
Met Asp Pro Glu Lys Ala Val Glu Met Val Asp Glu Asn Thr Ile Cys
190 195 200 205
gta gct gct atc ttg ggt tcc aca ctc aat ggt gaa ttt gaa gat gtt 733
Val Ala Ala Ile Leu Gly Ser Thr Leu Asn Gly Glu Phe Glu Asp Val
210 215 220
aag cgc ttg aat gac ctc ttg att gag aag aac aaa gaa acc ggg tgg 781

Lys	Arg	Leu	Asn 225	Asp	Leu	Leu	Ile	Glu 230	Lys	Asn	Lys	Glu	Thr 235	Gly	Trp		
gac Asp	act Thr	cca Pro 240	att Ile	cat His	gtg Val	gat Asp	gca Ala 245	gca Ala	agt Ser	ggg Gly	gga Gly	ttt Phe 250	att Ile	gca Ala	cca Pro		829
ttc Phe	ctt Leu 255	tat Tyr	cca Pro	gag Glu	ctt Leu	gaa Glu 260	tgg Trp	gac Asp	ttt Phe	aga Arg	ttg Leu 265	cca Pro	ttg Leu	gtg Val	aag Lys		877
agt Ser 270	ata Ile	aac Asn	gtg Val	agt Ser	ggg Gly 275	cac His	aaa Lys	tat Tyr	ggg Gly	ctt Leu 280	ggt Val	tat Tyr	gct Ala	ggg Gly	att Ile 285		925
ggg Gly	tgg Trp	gcc Ala	att Ile	tgg Trp 290	agg Arg	aat Asn	aag Lys	gaa Glu	gac Asp 295	tta Leu	cct Pro	gac Asp	gaa Glu	ctt Leu 300	atc Ile		973
ttc Phe	cac His	att Ile	aat Asn 305	tat Tyr	ctt Leu	ggg Gly	gct Ala	gat Asp 310	caa Gln	cct Pro	act Thr	ttc Phe 315	act Thr	ctc Leu	aac Asn		1021
ttc Phe	tct Ser	aaa Lys 320	ggg Gly	tct Ser	agc Ser	caa Gln	gta Val 325	att Ile	gct Ala	caa Gln	tat Tyr	tac Tyr 330	caa Gln	ctt Leu	att Ile		1069
cgc Arg	ttg Leu 335	ggg Gly	ttt Phe	gag Glu	ggg Gly	tac Tyr 340	aag Lys	aat Asn	ggt Val	atg Met	gag Glu 345	aat Asn	tgt Cys	caa Gln	gaa Glu		1117
aat Asn 350	gca Ala	agg Arg	gta Val	cta Leu	aga Arg 355	gaa Glu	gga Gly	ctt Leu	gaa Glu	aaa Lys 360	agt Ser	gga Gly	aga Arg	ttc Phe	aac Asn 365		1165
ata Ile	ata Ile	tcc Ser	aaa Lys	gaa Glu 370	att Ile	gga Gly	ggt Val	cca Pro	tta Leu 375	gta Val	gct Ala	ttc Phe	tct Ser	ctt Leu 380	aaa Lys		1213
gac Asp	aac Asn	agt Ser	caa Gln 385	cac His	aat Asn	gag Glu	ttc Phe	gaa Glu 390	att Ile	tct Ser	gaa Glu	act Thr	ctt Leu 395	aga Arg	aga Arg		1261
ttt Phe	gga Gly	tgg Trp 400	att Ile	att Ile	cct Pro	gca Ala	tat Tyr 405	act Thr	atg Met	cca Pro	cca Pro	aat Asn 410	gct Ala	caa Gln	cat His		1309
gtc Val	aca Thr 415	ggt Val	ctc Leu	aga Arg	ggt Val	gtc Val 420	att Ile	aga Arg	gaa Glu	gat Asp	ttc Phe 425	tcc Ser	cgt Arg	aca Thr	ctc Leu		1357
gcc Ala 430	gag Glu	cga Arg	ctg Leu	gta Val	ata Ile 435	gac Asp	att Ile	gaa Glu	aaa Lys	gtc Val 440	ctc Leu	cac His	gag Glu	cta Leu	gac Asp 445		1405
aca Thr	ctt Leu	ccg Pro	gcg Ala	agg Arg 450	gtc Val	aac Asn	gct Ala	aag Lys	cta Leu 455	gcc Ala	gtg Val	gcc Ala	gag Glu	gcg Ala 460	aat Asn		1453
ggc Gly	agc Ser	ggc Gly	gtg Val 465	cat His	aag Lys	aaa Lys	aca Thr	gat Asp 470	aga Arg	gaa Glu	gtg Val	cag Gln	ctt Leu 475	gag Glu	att Ile		1501
act	act	gca	tgg	aag	aaa	ttt	gtt	gct	gat	aag	aag	aag	aag	act	aac		1549

Thr Thr Ala Trp Lys Lys Phe Val Ala Asp Lys Lys Lys Lys Thr Asn
480 485 490

gga gtt tgt taatttaatt taacaaaata tgtttataat taatatgatg 1598
Gly Val Cys
495

atttataact actagcagtg gtactgcttg tttttatatt tgaattggtg ggttttttga 1658
gtatgaggag ctagctatatt attgctagtg aaatattggt tgaaaaa 1705

<210> 12

<211> 496

<212> PRT

<213> Nicotiana tabacum

<400> 12

Met Val Leu Ser Lys Thr Ala Ser Glu Ser Asp Val Ser Ile His Ser
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Thr Phe Ala Ser Arg Tyr Val Arg Thr Ser Leu Pro Arg Phe Lys Met
20 25 30

Pro Glu Asn Ser Ile Pro Lys Glu Ala Ala Tyr Gln Ile Ile Asn Asp
35 40 45

Glu Leu Met Leu Asp Gly Asn Pro Arg Leu Asn Leu Ala Ser Phe Val
50 55 60

Thr Thr Trp Met Glu Pro Glu Cys Asn Lys Leu Met Met Asp Ser Ile
65 70 75 80

Asn Lys Asn Tyr Val Asp Met Asp Glu Tyr Pro Val Thr Thr Glu Leu
85 90 95

Gln Asn Arg Cys Val Asn Met Ile Ala His Leu Phe Asn Ala Pro Leu
100 105 110

Gly Asp Gly Glu Thr Ala Val Gly Val Gly Thr Val Gly Ser Ser Glu
115 120 125

Ala Ile Met Leu Ala Gly Leu Ala Phe Lys Arg Lys Trp Gln Asn Lys
130 135 140

Met Lys Ala Gln Gly Lys Pro Cys Asp Lys Pro Asn Ile Val Thr Gly
145 150 155 160

Ala Asn Val Gln Val Cys Trp Glu Lys Phe Ala Arg Tyr Phe Glu Val
 165 170 175

Glu Leu Lys Glu Val Lys Leu Ser Asp Gly Tyr Tyr Val Met Asp Pro
 180 185 190

Glu Lys Ala Val Glu Met Val Asp Glu Asn Thr Ile Cys Val Ala Ala
 195 200 205

Ile Leu Gly Ser Thr Leu Asn Gly Glu Phe Glu Asp Val Lys Arg Leu
 210 215 220

Asn Asp Leu Leu Ile Glu Lys Asn Lys Glu Thr Gly Trp Asp Thr Pro
 225 230 235 240

Ile His Val Asp Ala Ala Ser Gly Gly Phe Ile Ala Pro Phe Leu Tyr
 245 250 255

Pro Glu Leu Glu Trp Asp Phe Arg Leu Pro Leu Val Lys Ser Ile Asn
 260 265 270

Val Ser Gly His Lys Tyr Gly Leu Val Tyr Ala Gly Ile Gly Trp Ala
 275 280 285

Ile Trp Arg Asn Lys Glu Asp Leu Pro Asp Glu Leu Ile Phe His Ile
 290 295 300

Asn Tyr Leu Gly Ala Asp Gln Pro Thr Phe Thr Leu Asn Phe Ser Lys
 305 310 315 320

Gly Ser Ser Gln Val Ile Ala Gln Tyr Tyr Gln Leu Ile Arg Leu Gly
 325 330 335

Phe Glu Gly Tyr Lys Asn Val Met Glu Asn Cys Gln Glu Asn Ala Arg
 340 345 350

Val Leu Arg Glu Gly Leu Glu Lys Ser Gly Arg Phe Asn Ile Ile Ser
 355 360 365

Lys Glu Ile Gly Val Pro Leu Val Ala Phe Ser Leu Lys Asp Asn Ser
 370 375 380

Gln His Asn Glu Phe Glu Ile Ser Glu Thr Leu Arg Arg Phe Gly Trp
 385 390 395 400

Ile Ile Pro Ala Tyr Thr Met Pro Pro Asn Ala Gln His Val Thr Val
 405 410 415

Leu Arg Val Val Ile Arg Glu Asp Phe Ser Arg Thr Leu Ala Glu Arg
420 425 430

Leu Val Ile Asp Ile Glu Lys Val Leu His Glu Leu Asp Thr Leu Pro
435 440 445

Ala Arg Val Asn Ala Lys Leu Ala Val Ala Glu Ala Asn Gly Ser Gly
450 455 460

Val His Lys Lys Thr Asp Arg Glu Val Gln Leu Glu Ile Thr Thr Ala
465 470 475 480

Trp Lys Lys Phe Val Ala Asp Lys Lys Lys Lys Thr Asn Gly Val Cys
485 490 495

<210> 13

<211> 1771

<212> DNA

<213> Nicotiana tabacum

<220>

<221> CDS

<222> (67)..(1554)

<223>

<400> 13

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gccgcc atg gtt ctg tcc aag aca gcg tcg gaa agt gac gtc tcc gtt 108
Met Val Leu Ser Lys Thr Ala Ser Glu Ser Asp Val Ser Val
1 5 10

cac tcc act ttc gcc tcc cga tat gtt cga act tct ctt ccc agg ttt 156
His Ser Thr Phe Ala Ser Arg Tyr Val Arg Thr Ser Leu Pro Arg Phe
15 20 25 30

aaa atg cca gag aat tca ata cca aag gaa gca gca tat cag att ata 204
Lys Met Pro Glu Asn Ser Ile Pro Lys Glu Ala Ala Tyr Gln Ile Ile
35 40 45

aat gat gag ctt atg tta gat gga aat cca agg cta aat tta gca tct 252
Asn Asp Glu Leu Met Leu Asp Gly Asn Pro Arg Leu Asn Leu Ala Ser
50 55 60

ttc gtt aca aca tgg atg gag cca gaa tgt aat acg tta atg atg gat 300
Phe Val Thr Thr Trp Met Glu Pro Glu Cys Asn Thr Leu Met Met Asp
65 70 75

tcc att aac aag aac tac gtt gac atg gat gaa tac cct gta acc act 348

Ser	Ile	Asn	Lys	Asn	Tyr	Val	Asp	Met	Asp	Glu	Tyr	Pro	Val	Thr	Thr		
	80					85					90						
gag	ctt	cag	aat	cga	tgt	gta	aat	atg	ata	gct	cat	ttg	ttt	aat	gca	396	
Glu	Leu	Gln	Asn	Arg	Cys	Val	Asn	Met	Ile	Ala	His	Leu	Phe	Asn	Ala		
95					100					105					110		
cca	ctt	gga	gat	gga	gag	act	gca	ggt	gga	ggt	gga	act	gtt	gga	tcc	444	
Pro	Leu	Gly	Asp	Gly	Glu	Thr	Ala	Val	Gly	Val	Gly	Thr	Val	Gly	Ser		
				115					120					125			
tct	gaa	gct	att	atg	ctt	gct	gga	tta	gcc	ttt	aag	aga	aaa	tgg	caa	492	
Ser	Glu	Ala	Ile	Met	Leu	Ala	Gly	Leu	Ala	Phe	Lys	Arg	Lys	Trp	Gln		
			130					135					140				
aat	aaa	atg	aaa	gcc	caa	ggc	aag	ccc	ttt	gat	aag	ccc	aat	att	gtc	540	
Asn	Lys	Met	Lys	Ala	Gln	Gly	Lys	Pro	Phe	Asp	Lys	Pro	Asn	Ile	Val		
		145					150					155					
acc	ggt	gct	aat	gtc	cag	gtg	tgt	tgg	gag	aaa	ttt	gca	agg	tat	ttt	588	
Thr	Gly	Ala	Asn	Val	Gln	Val	Cys	Trp	Glu	Lys	Phe	Ala	Arg	Tyr	Phe		
	160					165					170						
gaa	gtg	gag	ttg	aaa	gaa	gta	aaa	ttg	agt	gat	gga	tac	tat	gtg	atg	636	
Glu	Val	Glu	Leu	Lys	Glu	Val	Lys	Leu	Ser	Asp	Gly	Tyr	Tyr	Val	Met		
175					180					185					190		
gac	cct	gag	aaa	gct	gtg	gaa	atg	gtg	gat	gag	aat	acc	att	tgt	ggt	684	
Asp	Pro	Glu	Lys	Ala	Val	Glu	Met	Val	Asp	Glu	Asn	Thr	Ile	Cys	Val		
				195					200					205			
gct	gct	atc	tta	ggc	tca	aca	ctc	aat	ggc	gaa	ttt	gaa	gat	ggt	aag	732	
Ala	Ala	Ile	Leu	Gly	Ser	Thr	Leu	Asn	Gly	Glu	Phe	Glu	Asp	Val	Lys		
			210					215					220				
cgt	ttg	aat	gac	ctt	ttg	att	gag	aag	aac	aaa	gaa	acc	ggg	tgg	gac	780	
Arg	Leu	Asn	Asp	Leu	Leu	Ile	Glu	Lys	Asn	Lys	Glu	Thr	Gly	Trp	Asp		
		225					230					235					
act	cca	att	cat	gtg	gat	gca	gca	agt	ggc	gga	ttt	att	gca	cca	ttc	828	
Thr	Pro	Ile	His	Val	Asp	Ala	Ala	Ser	Gly	Gly	Phe	Ile	Ala	Pro	Phe		
	240					245					250						
ctt	tat	cca	gag	ctt	gaa	tgg	gac	ttt	aga	ttg	cca	ttg	gag	aag	agt	876	
Leu	Tyr	Pro	Glu	Leu	Glu	Trp	Asp	Phe	Arg	Leu	Pro	Leu	Glu	Lys	Ser		
255					260					265					270		
att	aat	gtg	agt	ggc	cac	aaa	tat	ggc	ctt	gtc	tat	gct	ggc	att	ggc	924	
Ile	Asn	Val	Ser	Gly	His	Lys	Tyr	Gly	Leu	Val	Tyr	Ala	Gly	Ile	Gly		
				275					280					285			
tgg	gcc	att	tgg	agg	aat	aag	gaa	gac	ttg	cct	gat	gaa	ctt	att	ttc	972	
Trp	Ala	Ile	Trp	Arg	Asn	Lys	Glu	Asp	Leu	Pro	Asp	Glu	Leu	Ile	Phe		
			290					295					300				
cac	atc	aat	tac	ctt	ggc	gct	gat	caa	cct	act	ttc	act	ctc	aac	ttc	1020	
His	Ile	Asn	Tyr	Leu	Gly	Ala	Asp	Gln	Pro	Thr	Phe	Thr	Leu	Asn	Phe		
		305					310					315					
tct	aaa	ggc	tct	agc	caa	gta	att	gct	caa	tat	tac	caa	ctt	att	cgc	1068	
Ser	Lys	Gly	Ser	Ser	Gln	Val	Ile	Ala	Gln	Tyr	Tyr	Gln	Leu	Ile	Arg		
	320					325					330						
ttg	ggc	ttt	gag	ggc	tac	aag	aat	ggt	atg	gag	aat	tgt	caa	gaa	aat	1116	

Leu Gly Phe Glu Gly Tyr Lys Asn Val Met Glu Asn Cys Gln Glu Asn
 335 340 345 350

gca agg gta tta aga gaa gga att gaa aaa agt gga aga ttc aac ata 1164
 Ala Arg Val Leu Arg Glu Gly Ile Glu Lys Ser Gly Arg Phe Asn Ile
 355 360 365

atc tcc aaa gaa att gga gtt ccc tta gta gca ttt tct ctt aaa gac 1212
 Ile Ser Lys Glu Ile Gly Val Pro Leu Val Ala Phe Ser Leu Lys Asp
 370 375 380

aac agt caa cac aat gag ttc gaa att tct gaa act ctt aga aga ttt 1260
 Asn Ser Gln His Asn Glu Phe Glu Ile Ser Glu Thr Leu Arg Arg Phe
 385 390 395

gga tgg att gtt ctg gca tat act atg cca cca aat gct caa cat gtc 1308
 Gly Trp Ile Val Leu Ala Tyr Thr Met Pro Pro Asn Ala Gln His Val
 400 405 410

aca gtt ctc aga gtt gtc att aga gaa gat ttc tcc cgc aca cta gcg 1356
 Thr Val Leu Arg Val Val Ile Arg Glu Asp Phe Ser Arg Thr Leu Ala
 415 420 425 430

gag cga ctg gta ata gac att gaa aaa gtc ttc cac gga gta gac aca 1404
 Glu Arg Leu Val Ile Asp Ile Glu Lys Val Phe His Gly Val Asp Thr
 435 440 445

ctt ccg gcg agg gtc aac gct aag cta gcc gtg gcc gag gcg aat gcc 1452
 Leu Pro Ala Arg Val Asn Ala Lys Leu Ala Val Ala Glu Ala Asn Gly
 450 455 460

agc ggc gtg cat aag aaa aca gat aga gaa gtg cag cta gag att act 1500
 Ser Gly Val His Lys Lys Thr Asp Arg Glu Val Gln Leu Glu Ile Thr
 465 470 475

act gca tgg ttg aaa ttt gtt gct gat aag aag aag aag act aat gga 1548
 Thr Ala Trp Leu Lys Phe Val Ala Asp Lys Lys Lys Lys Thr Asn Gly
 480 485 490

gtt tgt taatttaatt taacaaaaaa aaagtttata atatggtgat ttatgtaact 1604
 Val Cys
 495

actagcagtc gtactgcttg ttttttatat ttgagttgat gtgttttttg agcacttgag 1664

gagctagcta gttattgcta gtgaaaaaatt ggatgatata ttttgacta ctttgtaagt 1724

ttgtattatt aatccaaatt aaacgatatt tatcataaaaa aaaaaaa 1771

<210> 14

<211> 496

<212> PRT

<213> Nicotiana tabacum

<400> 14

Met Val Leu Ser Lys Thr Ala Ser Glu Ser Asp Val Ser Val His Ser
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Thr Phe Ala Ser Arg Tyr Val Arg Thr Ser Leu Pro Arg Phe Lys Met
 20 25 30
 Pro Glu Asn Ser Ile Pro Lys Glu Ala Ala Tyr Gln Ile Ile Asn Asp
 35 40 45
 Glu Leu Met Leu Asp Gly Asn Pro Arg Leu Asn Leu Ala Ser Phe Val
 50 55 60
 Thr Thr Trp Met Glu Pro Glu Cys Asn Thr Leu Met Met Asp Ser Ile
 65 70 75 80
 Asn Lys Asn Tyr Val Asp Met Asp Glu Tyr Pro Val Thr Thr Glu Leu
 85 90 95
 Gln Asn Arg Cys Val Asn Met Ile Ala His Leu Phe Asn Ala Pro Leu
 100 105 110
 Gly Asp Gly Glu Thr Ala Val Gly Val Gly Thr Val Gly Ser Ser Glu
 115 120 125
 Ala Ile Met Leu Ala Gly Leu Ala Phe Lys Arg Lys Trp Gln Asn Lys
 130 135 140
 Met Lys Ala Gln Gly Lys Pro Phe Asp Lys Pro Asn Ile Val Thr Gly
 145 150 155 160
 Ala Asn Val Gln Val Cys Trp Glu Lys Phe Ala Arg Tyr Phe Glu Val
 165 170 175
 Glu Leu Lys Glu Val Lys Leu Ser Asp Gly Tyr Tyr Val Met Asp Pro
 180 185 190
 Glu Lys Ala Val Glu Met Val Asp Glu Asn Thr Ile Cys Val Ala Ala
 195 200 205
 Ile Leu Gly Ser Thr Leu Asn Gly Glu Phe Glu Asp Val Lys Arg Leu
 210 215 220
 Asn Asp Leu Leu Ile Glu Lys Asn Lys Glu Thr Gly Trp Asp Thr Pro
 225 230 235 240
 Ile His Val Asp Ala Ala Ser Gly Gly Phe Ile Ala Pro Phe Leu Tyr
 245 250 255
 Pro Glu Leu Glu Trp Asp Phe Arg Leu Pro Leu Glu Lys Ser Ile Asn
 260 265 270

Val Ser Gly His Lys Tyr Gly Leu Val Tyr Ala Gly Ile Gly Trp Ala
 275 280 285
 Ile Trp Arg Asn Lys Glu Asp Leu Pro Asp Glu Leu Ile Phe His Ile
 290 295 300
 Asn Tyr Leu Gly Ala Asp Gln Pro Thr Phe Thr Leu Asn Phe Ser Lys
 305 310 315 320
 Gly Ser Ser Gln Val Ile Ala Gln Tyr Tyr Gln Leu Ile Arg Leu Gly
 325 330 335
 Phe Glu Gly Tyr Lys Asn Val Met Glu Asn Cys Gln Glu Asn Ala Arg
 340 345 350
 Val Leu Arg Glu Gly Ile Glu Lys Ser Gly Arg Phe Asn Ile Ile Ser
 355 360 365
 Lys Glu Ile Gly Val Pro Leu Val Ala Phe Ser Leu Lys Asp Asn Ser
 370 375 380
 Gln His Asn Glu Phe Glu Ile Ser Glu Thr Leu Arg Arg Phe Gly Trp
 385 390 395 400
 Ile Val Leu Ala Tyr Thr Met Pro Pro Asn Ala Gln His Val Thr Val
 405 410 415
 Leu Arg Val Val Ile Arg Glu Asp Phe Ser Arg Thr Leu Ala Glu Arg
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 Ala Arg Val Asn Ala Lys Leu Ala Val Ala Glu Ala Asn Gly Ser Gly
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Ser Phe Val Thr Thr Trp Met Glu Pro Glu Cys Asp Lys Leu Met Met
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Asp Ser Ile Asn Lys Asn Tyr Val Asp Met Asp Glu Tyr Pro Val Thr
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act gag ctt cag aat cga tgt gta aac atg ata gct cat ttg ttt aat      398
Thr Glu Leu Gln Asn Arg Cys Val Asn Met Ile Ala His Leu Phe Asn
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gca cca ctt gaa gat gga gaa act gca gtt gga gtt gga act gtt gga      446
Ala Pro Leu Glu Asp Gly Glu Thr Ala Val Gly Val Gly Thr Val Gly
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Ser Ser Glu Ala Ile Met Leu Ala Gly Leu Ala Phe Lys Arg Lys Trp
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cag aac aaa atg aaa gcc caa ggc aaa ccc tgt gac aag ccc aac att      542
Gln Asn Lys Met Lys Ala Gln Gly Lys Pro Cys Asp Lys Pro Asn Ile
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Val Thr Gly Ala Asn Val Gln Val Cys Trp Glu Lys Phe Ala Arg Tyr
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ttt gaa gtg gag cta aag gaa gta aag ctt agt gaa gga tac tat gtg      638
Phe Glu Val Glu Leu Lys Glu Val Lys Leu Ser Glu Gly Tyr Tyr Val
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480 485 490

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Lys Lys Thr Asn Arg Val Cys
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tatgagtttg gttttcttga tttggttctt ttcagtactt gaaaagttgt tattgatatt 1721

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aaaa 1785

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<213> Petunia x hybrida

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Glu Leu Met Leu Asp Gly Asn Pro Arg Leu Asn Leu Ala Ser Phe Val
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Thr Thr Trp Met Glu Pro Glu Cys Asp Lys Leu Met Met Asp Ser Ile
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Asn Lys Asn Tyr Val Asp Met Asp Glu Tyr Pro Val Thr Thr Glu Leu
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Gln Asn Arg Cys Val Asn Met Ile Ala His Leu Phe Asn Ala Pro Leu
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Glu Asp Gly Glu Thr Ala Val Gly Val Gly Thr Val Gly Ser Ser Glu
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 Met Lys Ala Gln Gly Lys Pro Cys Asp Lys Pro Asn Ile Val Thr Gly
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 Glu Lys Ala Val Glu Met Val Asp Glu Asn Thr Ile Cys Val Ala Ala
 195 200 205
 Ile Leu Gly Ser Thr Leu Asn Gly Glu Phe Glu Asp Val Lys Arg Leu
 210 215 220
 Asn Asp Leu Leu Val Glu Lys Asn Lys Glu Thr Gly Trp Asp Thr Pro
 225 230 235 240
 Ile His Val Asp Ala Ala Ser Gly Gly Phe Ile Ala Pro Phe Ile Tyr
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 Pro Glu Leu Glu Trp Asp Phe Arg Leu Pro Leu Val Lys Ser Ile Asn
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 Val Ser Gly His Lys Tyr Gly Leu Val Tyr Ala Gly Ile Gly Trp Val
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 Val Trp Arg Asn Lys Asp Asp Leu Pro Asp Glu Leu Ile Phe His Ile
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 Asn Tyr Leu Gly Ala Asp Gln Pro Thr Phe Thr Leu Asn Phe Ser Lys
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 Gly Ser Ser Gln Val Ile Ala Gln Tyr Tyr Gln Leu Ile Arg Leu Gly
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 Tyr Glu Gly Tyr Lys Asn Val Met Glu Asn Cys Gln Glu Asn Ala Ser
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 Val Leu Arg Glu Gly Leu Glu Lys Thr Gly Arg Phe Asn Ile Ile Ser
 355 360 365

Lys Glu Ile Gly Val Pro Leu Val Ala Phe Ser Leu Lys Asp Asn Arg
370 375 380

Gln His Asn Glu Phe Glu Ile Ser Glu Thr Leu Arg Arg Phe Gly Trp
385 390 395 400

Ile Val Pro Ala Tyr Thr Met Pro Pro Asn Ala Gln His Ile Thr Val
405 410 415

Leu Arg Val Val Ile Arg Glu Asp Phe Ser Arg Thr Leu Ala Glu Arg
420 425 430

Leu Val Arg Asp Ile Glu Lys Val Leu His Glu Leu Asp Thr Leu Pro
435 440 445

Ala Arg Val Asn Ala Lys Leu Ala Val Ala Glu Glu Gln Ala Ala Ala
450 455 460

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Page 41

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Val Ser Thr Trp Met Glu Pro Glu Cys Asp Lys Leu Ile Met Ser Ser
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420 425 430

Arg Leu Val Ser Asp Ile Glu Lys Ile Leu Ser Glu Leu Asp Thr Gln
435 440 445

Pro Pro Arg Leu Pro Thr Lys Ala Val Arg Val Thr Ala Glu Glu Val
450 455 460

Arg Asp Asp Lys Gly Asp Gly Leu His His Phe His Met Asp Thr Val
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32

<210> 21

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